



Environment



Water Community



Disaster Management Community

Solution Exchange for the Water Community Solution Exchange for the Disaster Management Community Consolidated Reply

Query: New Approaches to Better Sanitation during Emergencies - Examples; Advice

Compiled by [Nitya Jacob](#) and [G. Padmanabhan](#), Resource Persons and [Sunetra Lala](#) and [Nupur Arora](#), Research Associates

Issue Date: 16 September 2009

From [Rajeev R. Rana](#), United Nations Children's Fund, Supaul, Bihar
Posted 19 August 2009

Sanitation during emergencies is an important area of concern. Emergencies paradoxically present an opportunity to promote sanitation, with a fresh approach. When floods destroy sanitation facilities, it sets back efforts to promote sanitation among communities. To facilitate this, it is critical to involve people in sanitation planning during emergencies so the new strategy fits local needs.

Equally important is women's participation, to ensure that the new strategy addresses their needs for sanitation during and after the emergency. There are many reasons why people make toilets, and these should inform any new approach to sanitation. These are:

Privacy: A toilet can be simple but the need for privacy makes it important for a toilet to have a good shelter, ideally made from local material. This is especially important during an emergency when buildings may have been destroyed

Safety: A toilet should be safe and well-built, located in a safe place

Comfort: People will prefer a comfortable toilet large enough to stand up and move around in

Cleanliness: People will avoid a toilet if it is dirty and smelly.

Respect: A well-kept toilet raises the status of its owner and this is often why people spend money to build one.

Gender: Women have an especially hard time to meet their sanitation needs during emergencies. However, they may lack money, resources, power, or confidence to meet their needs and leaving them out of the planning process puts them at greater risk.

Against this background, I would like members of the Water and Disaster Management Communities to provide inputs on the following:

- What are the new examples/approaches to sanitation that can improve access and usage during normal times and emergencies?
- How can we raise awareness among those who have recently been through an emergency about sanitation and hygiene?
- What are specific roles of the community, schools, government officials and implementation agencies?

Your responses will help our programmes to provide better community sanitation both during emergencies and at normal times.

Responses were received, with thanks, from

1. [Prasad Sankpal](#), District Collector's Office, Kolhapur District, Maharashtra
2. [Abhishek Mendiratta](#), Independent Consultant, New Delhi
3. [Sakshi Saini](#), Institute of Home Economics, Delhi University, Delhi
4. [Raj Kamal Srivastava](#), United Nations Children's Fund, Allahabad
5. [Binukumar.G. S.](#), Institute for Resource Analysis and Policy, Hyderabad
6. [Prakash Kumar](#), Stockholm Environment Institute-United Nations Children's Fund, New Delhi
7. [Shashikant Kumar](#), Green Eminent Research Centre, Vadodara
8. [Johnson Rhenius Jeyaseelan](#), WaterAid India, Lucknow
9. [Jorge Caravotta](#), United Nations Children's Fund, New Delhi
10. [Atul Rawat](#), DMV Business and Market Research Pvt. Ltd., Hyderabad
11. [Yusuf Kabir](#), United Nations Children's Fund, Mumbai
12. [Seema Verma](#), Royal Bank of Scotland Group, Mumbai
13. [Jyotsna Bapat](#), Independent Senior Consultant, New Delhi
14. [Arunabha Majumder](#), Presidency College, Jadavpur University, Kolkata
15. [Gajanan Kale](#), Apeksha Homoeo Society, Amraoti, Maharashtra

Further contributions are welcome!

[Summary of Responses](#)
[Comparative Experiences](#)
[Related Resources](#)
[Responses in Full](#)

Summary of Responses

The lack of sanitation during emergencies can cause an epidemic of water-borne diseases. This happens when floodwater carries human and/or animal waste from the fields or toilets into drinking water sources. Toilets also get flooded and compound the problem. It is also tough for people affected by these emergencies to store water so it is not contaminated, and treat water before drinking.

Therefore, in flood-prone areas, people may choose to make household latrines in places where floodwater cannot reach. If this is not possible, people in these areas may opt for community latrines built at similar locations. Planners can use geographic information system (GIS) to map

the village and decide optimum locations for toilets. In addition to designs under the Total Sanitation Campaign (TSC), people can opt for ecosan models and other types of toilets that prevent contact with the faeces.

People realise the utility of toilets during floods, when there is no place for defecation except open water; the same water is used for bathing and washing. To address this issue, there is a need for an awareness campaign to generate demand for sanitation. Local TSC coordinators have used media like wall paintings, leaflets, posters, cartoon booklets and a sanitation pledge to sensitize communities during to emergencies. Street plays are another simple yet power medium that incorporate both sanitation and emergencies.

The coordinators or others tasked with maintaining sanitation need to conduct awareness sessions on hygiene education. These will include safe disposal of children's faeces, hand-washing with soap after defecation, and before cooking and serving food. This is especially important for people living in relief camps or relief sites as displaced people are most likely to ignore basic hygiene. The bottom line is, therefore, to increase the use of toilets.

Alongside such campaigns, users need affordable, accessible and convenient technical options for toilets. All the options ought to be flood-resistant. The government needs to provide flood-resistant toilets at relief sites.

In Kolhapur district, [Maharashtra](#), the District Collector's office has set up water and sanitation teams (VWSC) in each village. They have developed cost-effective and light mobile toilets, and have taken care to provide separate toilets for men and women. However, in another [state government programme](#), the toilets could not be maintained due to structural deficiencies.

The Prakalp programme in [Bihar](#), run by the Public Health Engineering Department, has constituted village health and sanitation committees. It conducts information education and communications (IEC) activities that include meetings of self-help group members, panchayat representatives, gram sabha meetings, video shows, street plays, banners, posters and wall writing. Schools, anganwadis and health centres are the focus of these campaigns as earlier discussions on the Water Community have underlined the importance of schools as disaster relief centres.

Before last year's flood of the Kosi River, [WaterAid India](#) (WAI) started a pilot emergency preparedness programme in 25 villages in five districts of the state. They developed an IEC campaign and provided hardware options especially for disaster-prone areas. Their experience shows the government has to build sanitation into disaster preparedness. These programmes need a strong people-focus. An inter-agency group is necessary for coordination, cooperation and management for successful sanitation measures during emergencies. Schools double as relief centres, and therefore need flood-proof toilets as well. Disaster management during floods need to be featured in school curricula. Rainwater harvesting can be an option for providing drinking water during floods.

Another option is the emergency chemical toilet, comprising of a covered plastic bucket, plastic garbage bags, a bleaching agent, baking soda and a few other common toilet articles. VWSCs can keep several of these in disaster relief centres, ready to use in the event of a flood.

In Leh, Jammu and Kashmir, people make a deep trench for a toilet, located walking distance from their houses. Their houses are elevated on stilts, and the toilets are located down-wind so their smell does not enter the houses. Another place to build toilets is along roads. These are usually elevated and do not go underwater if the floods are not severe. Regardless of where they

are built, in flood-prone areas toilets have to be robust enough to withstand water and prevent contact with faeces.

Thus, floods provide an opportunity for those working on sanitation to persuade people to construct and use toilets. People living in relief camps can be habituated into the use of toilets. Once the floods recede, sanitation workers can persuade them to construct and use toilets. Toilet construction ought to be part of the rehabilitation measures to reinforce the newly acquired sanitation and hygiene behaviour of people.

Comparative Experiences

Bihar

Emergency Preparedness Programme Reduces Morbidity and Mortality due to Water-borne Diseases, Madhubani, Darbhanga, Samastipur, Muzffarpur and Sitamarhi Districts (from [Johnson Rhenius Jeyaseelan](#), *WaterAid India, Lucknow*)

WaterAid India launched an emergency preparedness programme with the objective of setting up models of flood preparedness in 25 villages in the five districts of Bihar. The activities included awareness of communities and construction of flood-proof water and sanitation structures. When the floods hit the programme reduced morbidity and mortality due to diarrhea and people access water and sanitation facilities. Read [more](#)

Implementing IEC Strategies Leads to Successful Implementation of Water and Sanitation Programmes (from [Raj Kamal Srivastava](#), *United Nations Children's Fund, Allahabad*)

As part of water and sanitation programmes, village health and sanitation committees have been constituted across villages to oversee water, health and sanitation facilities. Strategic IEC activities have been undertaken including video shows, street theatres, posters, wall writings, etc. Schools and anganwadi centres are also being targeted under these programmes. The programmes have been successful. However, child friendly toilets remain an area of concern.

Maharashtra

Low Cost, Mobile Toilets Provide Relief for both Men and Women during Emergencies, Kolhapur District (from [Prasad Sankpal](#), *District Collector's Office, Kolhapur District, Maharashtra*)

Every village in this district has a Water and Sanitation team which is responsible for providing safe drinking water and sanitation facilities, including separate toilets men and women in camps in the disaster affected areas. A low cost, light toilet has also been developed especially for women, which is mobile. These are now also being used in religious gatherings where lakhs of people gather, thus necessitating sanitation facilities.

Sanitation and Hygiene Programme fails to prevent Water Borne Diseases, Amraoti District (from [Gajanan Kale](#), *Apeksha Homoeo Society, Amraoti, Maharashtra*)

The Maharashtra Government initiated a sanitation and hygiene programme, and building toilets was the main component under the programme. Panchayat Samities were involved in the implementation and the target number of toilets was achieved. These toilets, however, were situated in low-lying areas as a result of which they were flooded during rains. The water was also contaminated, as a result of which many villagers suffered from water borne diseases.

Related Resources

Recommended Documentation

Urban Slum Dwellers in Kenya and Bangladesh Benefit from using Peepoo Bags which are Self-sanitising and Biodegradable (from [Prakash Kumar](#), Stockholm Environment Institute-United Nations Children's Fund, New Delh)

Case Study; by Elisabeth V. Münch, Camilla Wirseen, Deepa Patel, Ashley Wheaton and Alexander Jachnow; Deutsche Gesellschaft für Technische Zusammenarbeit; Germany; 2009;

Available at <http://www.solutionexchange-un.net.in/drm/cr/res19080901.pdf> (PDF; Size: 560KB)

Includes findings of an emerging toilet technology called "Peepoo" from field tests in urban slums of Kenya and Bangladesh, developed by the Swedish company Peepoople

From [Jorge Caravotta](#), United Nations Children's Fund, New Delhi

Important Notes on Rehydration and Management of Acute Bloody Diarrhoea Guidelines; UNICEF; New Delhi; 2009;

Available at <http://www.solutionexchange-un.net.in/drm/cr/res19080903.pdf> (PDF; Size: 490KB)

Shares important information and useful dos and don'ts for rehydration and diarrhoea, which was used by UNICEF to educate people on hygiene in the aftermath of cyclone Aila

Battling Water-borne Diseases in Cyclone-affected West Bengal

Article; by Jorge G. Caravotta; UNICEF; New Delhi; 2009;

Available at http://www.unicef.org/infobycountry/india_50730.html

Outlines the need for sustainable efforts at community and facility levels to support disaster affected people fight cholera and acute diarrheal diseases in a disaster situation

From [Seema Verma](#), Royal Bank of Scotland Group, Mumbai

Disposal of Garbage and Rubbish

Article; www.ChefNoah.com;

Available at <http://www.chefnoah.com/sanitation2.htm>

Provides useful tips on good sanitation practices during emergencies; also explains the process of preparing an Emergency Chemical Toilet

Innovations in Emergency Sanitation

Emergency Sanitation Workshop; Oxfam GB;

Available at

http://www.oxfam.org.uk/resources/learning/humanitarian/workshop_emerg_sanitation.html

Highlights useful ideas on how to improve sanitation practices in a long-term, sustainable manner, which is also suitable for emergency situations

Environmental Health in Emergencies and Disasters: A Practical Guide

Guide; by B. Wisner and J. Adams; World Health Organisations; 2003;

Available at

http://www.who.int/water_sanitation_health/hygiene/emergencies/emergencies2002/en/

Guide summarizes the essential aspects of environmental health management in disasters situations including water and sanitation services

Improving Sanitation with the Peepoo Bag

Article; by Matt Embrey; Greenupgrader.com;

Available at <http://greenupgrader.com/7230/improving-sanitation-with-the-peepoo-bag/>

Article describes the benefits of using peepoo bags and explains how peepoo bags can be used in emergency situations

Emergency Sanitation: Assessment and Programme Design

Guidelines; by Peter Harrey, Sohrab Baghri , Bob Reed; Loughborough University; 2003;
Available at

[http://www.reliefweb.int/rw/lib.nsf/db900sid/LGEL-5Q4DGB/\\$file/lou-water-02.pdf?openelement](http://www.reliefweb.int/rw/lib.nsf/db900sid/LGEL-5Q4DGB/$file/lou-water-02.pdf?openelement)

Guidelines on emergency sanitation, aims to assist those involved in planning and implementing emergency sanitation programmes

From [Nupur Arora](#), Research Associate

Kameswaram Tsunami-Hit Village Becomes a Model village for Eco-Sanitation

By K.Y. Babu; WESNET Newsletter; February 2007;

http://www.wesnetindia.org/fileadmin/newsletter_pdf/Feb07/Kameswaram-ECOSAN.pdf (PDF;

Size: 137KB)

Outlines the importance of Ecological Sanitation (ECOSAN) technology, implemented by SCOPE in Tamil Nadu particularly in Tsunami hit coastal villages having high water tables

The Challenge in Disaster Reduction for the Water and Sanitation Sector: Improving Quality of Life by Reducing Vulnerabilities

Pan American Health Organization (PAHO/WHO), United Nations Children's Fund (UNICEF), International Strategy for Disaster Reduction (ISDR), International Federation of Red Cross and Red Crescent Societies (IFRC), 2006;

<http://www.paho.org/English/DD/PED/DesafiodelAgua.htm>

Draws attention to ensuring that water and sanitation systems remain fully operational in the aftermath of natural disasters, highlights importance of the risk management tools

Recommended Contacts and Experts

From [Nupur Arora](#), Research Associate

Dr. Lucas, Solid Waste Management Unit, Auroville

Auroville's Future, Center for Urban Research, Administrative Area, Auroville 605101, Tamil Nadu;
Tel: 91-413-2622170; aurofuture@auroville.org.in

Involved in the design and construction of ECOSAN toilets, which can be used to reduce water usage and prevent contamination of high water tables, particularly during disasters

Recommended Organizations and Programmes

From [Seema Verma](#), Royal Bank of Scotland Group, Mumbai

The Water Supply and Sanitation Collaborative Council, Switzerland

International Environment House, 9 Chemin des Anémones, 1219 Châtelaine, Geneva, Switzerland; Tel: 41-22-9178657; Fax: 41-22-9178084; wsscc@who.int;

<http://www.wsscc.org/en/what-we-do/networking-knowledge-management/national-level-activities/india/index.htm>

Multi-stakeholder partnership organization which promotes collaborations and works in the area of sanitation and hygiene promotion at the community level

Sustainable Organic Integrated Livelihoods, USA

124 Church Road, Sherburne, NY 13460, Halti, USA; soil_info@yahoo.com;

<http://www.oursoil.org/drytoilet.php>

The organization works on preserving soil resources in Halti; has provided on its website information on the importance, use and construction of dry (urine-diverting) toilets

WaterAid India, Madhya Pradesh (from [Johnson Rhenius Jeyaseelan](#))

E-7/846, Arera Colony, Bhopal 462016, Madhya Pradesh; Tel: 91-674-2531266;
wairoe@wateraid.org; http://www.wateraid.org/india/about_us/default.asp

An independent organization, which enables the world's poorest people to gain access to safe water, sanitation and hygiene education and began working in India in 1986

From [Raj Kamal Srivastava](#), United Nations Children's Fund, Allahabad

Total Sanitation Campaign (TSC)

Ministry of Rural Development, Department of Drinking Water, 247, A Wing, Nirman Bhawan, New Delhi 110011; Tel: 91-11-23010207; jstm@water.nic.in; http://ddws.nic.in/tsc_index.htm

Programme aimed at increasing awareness regarding sanitation among rural people, and so far 5.6 crore household toilets have been constructed across rural India under TSC

Swajaldhara

Ministry of Rural Development, Government of India, 9th Floor, Paryavarn Bhawan, CGO Complex, Lodhi Road, New Delhi 110003; Tel: 91-11-24361043; Fax: 91-11-24364113;
jstm@water.nic.in; <http://www.ddws.nic.in/swajaldhara.htm>

Drinking water supply scheme aimed at decentralised community implementation of drinking water projects, with community participation in the form of labour, cash, etc

From [Nupur Arora](#), Research Associate

United Nations Children's Fund (UNICEF), New Delhi

73, Lodhi Estate, New Delhi 110003; Tel: 91-11-24690401/24691410; Fax: 91-11-24627521, 24691410; newdelhi@unicef.org; http://www.unicef.org/wes/index_emergency.html

Provided immediate assistance to ensure continued and effective functioning of water and sanitation systems during the Tsunami

Responses in Full

[Prasad Sankpal](#), District Collector's Office, Kolhapur District, Maharashtra

This is a very important issue. In our district we have worked little bit on the issue. These points I would like to submit

- We have a Water and Sanitation Team at every village and the main responsibility of this team is to make the arrangements of safe drinking water in the affected area for the affected population and concentrate on sanitation issues like toilets for the camp members, separate for males and females.
- In the district we have developed one cost effective and very light structure toilet and these units are very easy to carry from one place to another.
- These were prepared for the women who face difficulties in camps and sanitation can be a problem there. These units are very useful and we using them at big religious functions such as Yatras, etc. where people gather in 6-7 lakhs.

[Abhishek Mendiratta](#), Independent Consultant, New Delhi

After clearing up scattered excreta during emergencies, the 'act of sanitation' involves the provision of basic sanitation facilities for men and women. To be effective, these must be linked to a hygiene campaign which makes open defecation in the relief centre unacceptable and shows people how to use and maintain the facilities provided. Emphasis should also be placed on

encouraging children to use toilet facilities. Such a campaign could be reinforced with a cadre of 'sanitation wardens' - men and women volunteers from the relief centre - to explain and if necessary enforce sanitation 'rules'. A mechanism must also be established to clear up the faces of children and infants too young to use the toilets provided. When a large group of people are excreting indiscriminately, it is necessary, first of all, to protect the food-chain and water supplies from contamination. This means preventing people from defecating on:

- The banks of rivers, streams, or ponds which may be used as a water source. If water is to be abstracted from shallow wells, then it is important to ensure that these wells are situated upstream of the defecation areas;
- Agricultural land planted with crops, particularly if the crops are soon to be handled or harvested for human consumption. Keeping people away from such areas may not be easy, particularly where traditional habits make such practices common. It may be necessary to construct a physical barrier, such as a fence, which may need patrolling.

An intermediate solution is required. It is usual for this to be some form of communal latrine, as communal latrines are quick and cheap to construct. Some are commercially available, but these are expensive and take time to transport to the site. In most cases, 'trench' latrines provide the simplest solution. The following intervention areas for hygiene promotion are suggested, based on observed health risks:

- Proper use and maintenance of sanitation facilities.
 - Safe disposal of children's faces.
 - Hand washing with soap after defecation, before food preparation or eating
 - Safe storage and handling of drinking water
- Facilitators are required to implement a hygiene promotion plan, working directly within the community. They are often the single most important factor in determining the success of a hygiene promotion plan. At least one man and one woman should be selected and trained to work in each temporary shelter. It is important to select the 'right' people as facilitators.

Sakshi Saini, Institute of Home Economics, Delhi University, Delhi

Sanitation is an issue of prime importance, and various policies and programmes have been implemented by the government and NGOs. But, it has been seen that the state armed with numerous policies, legislations, judiciary system and complex set of governance institutions have failed miserably to fulfill the objective of 'Sanitation for All'. The promotion of sanitation is not simply an engineering intervention for providing sanitary facilities. Success cannot be guaranteed without a change in the behaviour and attitudes of the community. The finding in the Madanpur Khadar area during a research highlighted that despite the availability of community toilets in the area, 90% of the population was openly defecating. The main reason for this behavior was lack of knowledge about the negative effects of open defecation and the trouble of going to the community toilet, standing in queues, paying for the service and lack of maintenance. People were not maintaining the community toilets and were neither interested in using them.

Thus, it becomes important to ensure people's participation and involvement to ensure better success rate of any programme or technology. Following are the recommendations stated to improve the sanitation conditions:

- Firstly, the alternative/technology provided should be affordable, easily accessible, and convenient to use and within the cultural parameters of the society.
- Secondly, before introducing the technology, the demand for that should be generated in the community, people should be made aware about its importance and motivated enough to go and invest on that.

- The important aspect to be kept in mind is to analyze and understand the history of participation and the participatory process in a given situation. Awareness is a pre-requisite for understanding any programme and facilitating its reception. Efforts have to be made through different methods to create awareness and need for sanitation among the people. Media like wall paintings, leaflets, sanitation pledge, during campaigns, cartoon booklets should be used to build awareness amongst the community.
- Street theaters can be used as a powerful medium for promoting use of sanitation facilities, while developing the script of the street theater should be simple, short and convey the messages with humor and emotion. These can be based on the day to day happening in the life of the community so that the viewers are able to identify with the situation depicted in the script and realize the need for change. Street theaters performances can be followed with live demonstrations of water conserving technologies and sustainable sanitation system.
- Advocacy initiatives to ensure adequate and quality service by the Municipal authorities for maintenance of community toilets should be promoted.
- Community should be made aware on sustainable sanitation approaches and it should be promoted massively.
- They should be made to understand how important sustainable sanitation are as precondition to achieve a whole series of MDGs (e.g. to reduce child mortality, to promote gender equity and empower women, to ensure environmental sustainability, to improve livelihood, and to reduce poverty).

Raj Kamal Srivastava, United Nations Children's Fund, Allahabad

This is really a very pertinent issue. In the northern part of India, there is a culture of open defecation as argue that it provides a sense of relief after open defecation. People also argue that inside the house premises, no such system should be created. Moreover, they are accustomed to defecate in open field.

With reference to Bihar, which is a place of droughts and flood at the same time, the WATSAN facility became more critical as it deteriorate the health condition of the local community. Local based initiatives needs to be explored particularly when the community is poor. The cost effective models of toilets are to be constructed. The PRAKALP under Public Health Engineering Department is looking after the TSC, Swajaldhara, ARWSP programs of Central govt. and Lohiya Swakchhata Yojana (LSY) of Govt. of Bihar in the state of Bihar. A village health and sanitation committee is also constituted at village level to oversee the health, water, and sanitation facilities in the village.

Definitely, a family having toilet in or around the house posses higher value in society compared to others. Community prefers to construct toilet distant to their houses. The chief minister and the PHED minister took various measures to keep the Bihar free from the WATSAN related diseases. Strategic IEC activities have been done from state level itself and in the district of Nalanda (Bihar), a district IEC focused to the needs of development blocks are formulated. This IEC strategy includes SHG/WSHG meetings, Panchayat members and village meetings, video shows, nukkad natak, banners, posters, wall writings etc. at grassroots. Every offices of the district, sub-divisions and development blocks are provided calendars. The schools, AWC, Health centres are special focus of the IEC strategy. The Boys and Girls school toilets and Anganwadi centers have pictorial paintings on the walls of the toilets. But the child friendly toilets are the area of concern.

Binukumar.G.S., Institute for Resource Analysis and Policy, Hyderabad

This is very interesting to discuss this topic not only in the phase of emergencies but also in the day to day life. The point mentioned by [Raj](#) is very important and prevalent. But my question is that how many people, especially the villagers are concerned about this.

Proper sanitation in human life is not a new concept. Our Government agencies and NGOs are working in this sector for several years and invested crores of rupees to eradicate this problem. But where we reached? Still these agencies are investing again and again and most interestingly almost of the beneficiaries is the same who received financial assistance to construct latrines earlier.

Gram panchayats and village level officials need to arrest this practice, instead of abetting it. The householders have also to be more responsible by becoming more principled in the use of funds from agencies. Some household members are demolishing the latrine components and sometimes they are selling this for cash. So the main challenge is to stop these malpractices. It is better to work out some legal measures to stop these malpractices not only for officials but also beneficiaries.

I am not concerned about the dignity issues that we are exaggerating. In a place like Kerala this dignity will be very high because people are living with very little land and their social concern is very high. So they are reluctant to go out and defecate in the open places. There will be a debate on this land availability and open defecation. Even in Bangalore city people are defecating in the road side and in housing areas where availability of land is very less. Another example of this issue is from Guntur, Andhra Pradesh. While travelling by train through this place travelers are covering their nose even for 10 to 15 minutes. The foul smell coming out of the night soil will stop breathing of the people for several minutes. Just imagine a big town like Guntur is producing this kind of public nuisance and people are living in the same surroundings. This is very funny to use the term "Night Soil" .I request the community members to explain how this term came. My suggestion is to change this term because we can see people are sitting with water bottles and pots for open defecation in the day time in several areas of our Country. When vehicles approaching these people are getting up and waiting for several minutes. This is also a leading to health problems for the people. But they are not ready to top this. Mulbagal, Karnataka is another example of this menace. Here people are defecating directly into the lakes and the same water is using for washing, Bathing, Animal Husbandry etc. The unprotected bore wells in the lakes are supplying water for the town population. Just imagine the effect of these issues. So we have to think about dignity as well as attitude.

Financial support to needy peoples to construct individual latrine and community latrines should be implemented with BAN on open defecation. In places people have acres of land and they are unwilling to construct or use latrines should be punished.

Water availability is not a major issue in 70% of the places where people are going for open defecation. So this excuse will be treated seriously.

Awareness creation is already reached the people and majority is well aware of this problems. We need a proper monitoring system to ensure the continuity of these activities. Support in intervals is very urgent and important.

The role of each agency is important and it will not be limited for providing financial support. Execution and usage should be monitored in between and proper functioning will be assured for a minimum period of six months.

School children can become part of this and they can monitor the sanitation activities. Organizing health and sanitation club in the premises of schools will help to boost these activities and they can act as a social monitoring unit.

Emergency time is a best opportunity to change the attitude of the people towards sanitation and health practices. Here freedom will be very less and the refugee will be forced to adapt with the available resources. Once people practice some good habits they will not go back to the past bad habits.

"Social control is the important factor in social life for better sanitation practices, sound health and sound environment."

[Prakash Kumar](#), Stockholm Environment Institute-United Nations Children's Fund, New Delhi

Unprecedented challenge during emergency made most of the community (particularly rural where already the coverage is very low) completely helpless to use the existing facility, if any or for otherwise go for OD in case of flooding for their daily call . And also it is very difficult to urgently provide any solution to this since the focus in beginning of the emergency was evacuation and food availability.

Now it is very common during emergency that drinking water is distributed in small plastic pouches that serve the purpose very well. Like this it is possible to distribute each individual with a "Peepoobag" to defecate during emergency situation.

The Peepoo bags are a self sanitizing, single use, biodegradable toilet bag which can become a valuable fertilizer.

Swedish company "Peepeople" are behind this innovation and further carrying out researches on it. It is low in cost and made of degradable plastic.

The peepoo bag work as a single use toilet, micro treatment unit that kills pathogens in 2-4 weeks by the toxicity of ammonia produced by urea (4 gm) put in each bag.

It is still in the trail stage but has potential to be part of a sustainable system with good planning for storage, collection, treatment, and reuse.

Please refer to a study paper on [Peepoo bags trial in Kenya and Bangladesh](#) for more information.

[Shashikant Kumar](#), Green Eminent Research Centre, Vadodara

Sanitation during emergencies is critical to prevent and protect communities from aftermath of the diseases. WATSAN related diseases are first to attack the people and communities. Following are the sanitation sequence during the emergencies

- Disaster - areas get Flooded forces people to remain on the safer places - people cannot go out in open fields. Result - defecate in water - later contaminated water is used for human consumption.
- People shifted out to relief camps, sanitation never planned, or insufficient to meet the community needs.

- Local body or emergency response team - delays action in cleaning and maintaining sanitary condition.
- Post disaster, community takes last priority in building sanitary facilities.
- Water and sanitation quality deteriorates till the intervention is provided.

Above all conditions can be tackled at individual stages -

- Planning for emergency shelters - All the panchayats should prepare themselves for the disasters and community hall to accommodate more population should be constructed. Temporary shelters like schools/hospitals are not designed to suit WATSAN during the emergency.
- Safe drinking water for human consumption should be available to all the relief centres, along with self purification kits.
- Reconstruction sites, should prioritize- sanitation first approach in rebuilding measures.
- Emergency response team - should also have special sanitation volunteers and machines to dispose the refuse from the areas.
- Technology innovation- for large scale-community latrines is required.

Moreover, community disaster preparedness kit should contain information on the sanitation and water usage related information.

Community should be able to identify the priority and should work for their betterment. Disaster always calls for collective action from community as well as administration; a public-private initiative in this regard can be searched out networking with NGO/CBOs.

There are very successful examples of emergency sanitation, except medical interventions, as during the Gujarat Earthquakes, which took special efforts to provide proper medical aid for any outbreak of WATSAN diseases.

Johnson Rhenius Jeyaseelan, WaterAid India, Lucknow

WAI before the onset of last year's kosi flood realised the importance of disaster preparedness and in partnership with Ministry of Disaster Management launched a pilot emergency preparedness programme in the identified districts with long-term objective of supporting Government of Bihar in developing and implementing a comprehensive emergency preparedness plan to effectively support water supply, sanitation and hygiene requirements in the flood prone areas of Bihar and short term objective of setting up models of flood preparedness in 25 villages in 5 districts (Madhubani, Darbhanga, Samastipur, Muzffarpur and Sitamarhi), for emulation by the Government and other agencies, Develop IEC Materials for the Government to promote on a large scale, Train Senior Government Staff in Disaster Preparedness and Contribute the WASH Section to the Government Document on Disaster Preparedness.

In the model 25 villages activities included awareness and sensitization of community, capacity building and construction of flood proof water sanitation structures in places where people come during floods. As diarrhoeal diseases are high at times of flood training was given to volunteers and awareness to community was given on diarrhoea management. In the identified villages in the 5 districts 4 seater community toilets, water source, water tank, water filters and intensive IEC campaign were done through mass media and street theatre. A disaster management kit was also given to each of the villages.

When the floods hit moderately in districts like Muzzafarpur (unlike the other districts like Supaul) the disaster preparedness programme reduced morbidity and mortality due to diarrhea, deaths

from snake bite and the water and sanitation facilities created helped the people immensely in access to water and sanitation facilities.

WAI and the Ministry of Disaster Management having being involved in disaster relief and disaster preparedness programme realize that the latter, disaster preparedness, is more important as it is sustainable solution and disaster relief be part of disaster management. The following were the learning's from this:

- Government should start programmes with financial allocation in disaster preparedness as part of its disaster management programme rather than on focusing mostly on relief
- People should be at the centre in all disaster preparedness programme for success, management and sustainability
- Inter Agency Group helped in coordination, cooperation and management and be part of disaster management
- In flood prone districts coordination between various departments is needed so that flood proof structures are created at time of installation in the villages like BWHPs with raised platforms, community latrines in higher elevated areas, Eco san latrines or raised HH latrines
- Schools which usually are relief centres during floods should have flood proof infrastructure
- Disaster management during floods should be part of school curriculum so that children are aware, trained, and be change agents and save lives during times of flood.
- Opt for rain water harvesting so that water can be available at times of flood

Also before floods public campaigns through radio, TV, newspaper should focus on water sanitation during emergencies like floods. For e.g. State government printed the posters developed by WAI in all major newspapers and also did wall paintings in villages and TV and audios spots were also part of this.

Water sanitation infrastructure when created should be flood proof. Also there should be provision to tap and use rain water so that same can be used during floods.

Formation of an emergency response team in each village and where they are equipped with emergency kits, life jacket, and medical kit will help save lives. For e.g. during Tsunami in Tamil Nadu before Tsunami only one village opted to get trained in emergency and in that village less lives were lost and the trained volunteers saved nearly 30 lives.

Please refer to an article on our experiences on emergency relief and preparedness (<http://www.solutionexchange-un.net.in/drm/cr/res19080902.doc>)

Jorge Caravotta, United Nations Children's Fund, New Delhi

We need to discuss this at two levels - FACILITY AND COMMUNITY.

I will write about Better Sanitation during Emergencies in Health facilities including Hospitals and PHCs and Subcenters

Context: During emergencies (especially what we call WATER emergencies, like floods, cyclones, typhoons) diarrhoea cases are always in the increase due to lack of Safe and Clean water. This problem is also seen at the same time in the villages and in the affected facilities (usually collapsed, overwhelmed).

Sanitation in Facilities (whenever diarrhoea cases in Hospitals and PHCs are in the increase) is neglected and the latrines and toilets in the facilities itself became a source of infection and reinfection for the patients and relatives of the patients.

Open defecation next to the facility is not a good practice; this is the reason why we need to INCREASE our efforts in KEEPING TOILETS clean at least in the facilities.

Bleaching powder is available but use in impractical way (sprinkling) too expensive and inefficient. Good example is to see the conditions of the toilets and latrines during a Cholera outbreak.

Please refer to the guidelines to share base on our latest experience during the Cholera outbreak in West Bengal "Aila" Cyclone (<http://www.solutionexchange-un.net.in/drm/cr/res19080903.pdf>) (PDF; Size: 4 MB)

See web story at http://www.unicef.org/infobycountry/india_50730.html.

Atul Rawat, DMV Business and Market Research Pvt. Ltd., Hyderabad

There is a growing need for sanitation practices during emergencies floods, earthquakes, storms, conflicts, droughts, etc. But there are other challenges also such as social and physical factors. Generally, during emergencies people are displaced in two ways:

In Situ: in which people spread out and centralized sanitation could not be possible. In this emergency (such as Flood), people do not want to leave their places or want to get back their home in shortest possible time. In this situation, it is difficult to provide emergency sanitation. Although through collective efforts of local community communal sanitation programmes can work.

Displaced: Sanitation programmes can work in an effective manner during emergency. Displaced people reside in camps, school or refugee camps, where it is helpful to sanitize there. Agencies can come in and build the infrastructure for better sanitization, which later the displaced people can manage. Even when they go home, they can implement this application because they know how to do it.

Yusuf Kabir, United Nations Children's Fund, Mumbai

It has been observed in emergencies, particularly during flood, communities opt for toilets. It is not necessary that community is well aware of using toilets, but in many cases, it is due to inundation of all traditional places of defecation. After receding of water the community gets back to old habits.

I think, what we need is a sustained Behavioural Change Communication and promotion of such technology options in terms of sanitation which are suitable for flood-prone areas. Often community react negatively when they see that their toilets are damaged or destroyed due to flood, where as, there is no such significant damage in their houses or other property.

Awareness is required to make community understand as toilet being an integral part of their homestead. It is just like a kitchen-shed or a dwelling room.

Therefore, my suggestion is that we should not wait for an emergency to address the critical gaps arises in terms of WATSAN during that period. A large scale mapping of flood prone GPs in

State/India are required. GIS can be used for that. Indicators like frequency of flood in last 10 years, scale/magnitude of devastation's etc. can be used as different themes to generate query. Based on the mapping, technology options, BCC and resource mobilization needs to be strategized.

Seema Verma, Royal Bank of Scotland Group, Mumbai

In India, over 700 million people defecate in the open - along roadsides, on farmland, in municipal parks and so on. According to the Water Supply and Sanitation Collaborative Council, a single gram of faeces can contain 10 million viruses, one million bacteria, a thousand parasite cysts and a hundred eggs of worms.

Every morning, when I travel to office, I come across the usual morning sight & plight of the less fortunate in a city like Mumbai. There is a daily emergency for this large section of people, who don't have access to a decent toilet system in India.

The first question that comes to my mind is should we view the subject as "Sanitation during emergencies" OR "How to avoid emergency due to lack of Sanitation facilities". Whatever solution is found most sustainable should also be recommended for day to day use for the poor. I happened to come across some sites on this subject. There are a load of tips which can be picked up from these. Personally I am most convinced about Peepoo bags concept and Dry toilet facilities.

- <http://www.chefnoah.com/sanitation2.htm>
- http://www.oxfam.org.uk/resources/learning/humanitarian/workshop_emerg_sanitation.html
- http://www.who.int/water_sanitation_health/hygiene/emergencies/em2002chap8.pdf
- <http://www.oursoil.org/drytoilet.php>
- <http://greenupgrader.com/7230/improving-sanitation-with-the-peepoo-bag/>
- BOOK - Emergency Sanitation: Assessment & Program design. By Peter Harrey, Sohrab Baghri , Bob Reed

Emergency Chemical Toilet (extract from <http://www.chefnoah.com/sanitation2.htm>)

The following items should be stored together inside a 5-gallon plastic bucket. The bucket will serve as the toilet during an emergency. To use this toilet simply remove the contents from the bucket, insert a large plastic garbage can liner into the bucket and fold the edges over the rim of the bucket. Mix one cup of liquid chlorine bleach to one-half gallon of water (one to ten ratio--do not use dry or powdered bleach as it is caustic and not safe for this type of use) and pour this solution into the bucket. This will kill germs and insure adequate coverage. Though the bucket may be somewhat uncomfortable to sit upon, it certainly beats the alternative.

After each usage replace the lid securely upon the bucket to keep insects out and to keep the smell contained. When the bucket is one-third to one-half full, tie the garbage bag liner shut and dispose of it appropriately (i.e., burying it, placing it inside a large covered metal garbage can for later disposal, or placing it in an approved disposal location). Put another liner inside the bucket and continue as above.

Other chemicals that can be used in place of liquid chlorine bleach are: HTH (calcium hypochlorite), which is available at swimming pool supply stores and is intended to be used in solution. Following the directions on the package it can be mixed and stored.

Caution: Do not use calcium hypochlorite to disinfect drinking water as it kills all the beneficial bacteria in the intestinal tract and thus causes mild diarrhea.

Portable toilet chemicals, both liquid and dry, are available at recreational vehicle (RV) supply stores. These chemicals are designed especially for toilets which are not connected to sewer lines. Use according to package directions. Powdered, chlorinated lime is available at building supply stores. It can be used dry. Be sure to get chlorinated lime, not quick lime which is highly alkaline and corrosive.

Caution: Chlorinated products which are intended to be mixed with water for use can be dangerous if used dry. You may also use powdered laundry detergent, Lysol, Pinesol, ammonia, or other household cleaning and disinfecting products. Where radioactive fallout does not present a hazard, a temporary pit privy may be constructed in the yard for use by several families. This offers a good method of waste disposal over extended periods of time.

The structure need not be elaborate, so long as it provides reasonable privacy and shelter. The pit should be made fly-proof by means of a tight-fitting riser, seat, and cover. A low mound of earth should be tamped around the base of the privy to divert surface drainage and help keep the pit dry. Accumulated waste should be covered with not less than 12 inches of earth when the privy is moved or abandoned.

Persons in city apartments, office buildings, or homes without yards should keep a supply of waterproof containers on hand for emergency waste disposal.

Homemade soil bags may also be used and are easily made by putting one large grocery bag inside another, with a layer of shredded newspaper or other absorbent material between. Apartment dwellers should have sufficient grocery bags on hand for possible emergencies. If you have a baby in your home, it is best to keep an ample supply of disposable diapers on hand for emergency use. If these are not available, emergency diaper needs can be met by lining rubber pants with cleansing tissue, toilet paper, scraps of cloth, or other absorbent materials.

To help insure proper sanitation it is imperative that you store a sufficient supply of disposable diapers, disposable wipes, and plastic garbage can liners. Change infants and toddlers regularly and keep them clean. Dispose of the soiled diapers in the plastic garbage can liners and keep them tightly sealed when not in use to help prevent the spread of disease.

Be sure to wash your own hands regularly when working with infants (especially after each diaper change). Typhoid fever, amoebic dysentery, diarrhea, infectious hepatitis, salmonella and giardiasis are diseases that spread rapidly in times of emergency and threaten all, yet are all diseases that can easily be controlled by simply following the rules of good sanitation.

Emergency Chemical Toilet

- 5-gallon plastic bucket (with tight fitting lid)
- 2 large boxes of garbage can liners (30 gallon size)
- 1 gallon liquid chlorine bleach or other chemical
- Pinesol®
- 6-8 rolls toilet paper
- feminine sanitary supplies
- 2 boxes baking soda
- 2 boxes trash can liners (8-10 gallon size)
- paper towels

What I saw during my visit to Leh a cold desert is an interesting example of toilet. It was a dry toilet so there was no water connection. There was a deep trench, a walking distance away from the residential place. The residence was on stilts where the animals lived in the lower level and grass stored at higher level with humans in between. So no one could smell the toilet and was located in a way that wind did not flow their way. One carried a filled water bottle and on you way back there was a tap to wash hands.

On further enquiry I found out that every 5 years or so they filled this up and dug a new one including the raised seat steps to it and bamboo cabinet etc. It reminded me of the one I visited in my uncle's house in Wardha, which used a bucket and had to be cleaned once a week by a sweeper with all its social implications. Hence I asked the question about it replacement in a low density population like Leh.

I think it is not different from the low cost sanitation promoted by UNICEF now that I think of it.

Arunabha Majumder, Presidency College, Jadavpur University, Kolkata

There are three major parts of a rural toilet,

- Underground structure,
- base structure, and
- Super structure.

All the above structures must withstand adverse conditions in emergencies or disaster. Unfortunately, in many places it is not done nor it is told to the villagers. In the name of Total Sanitation Campaign in many places toilets costing Rs 500/- to Rs 600/- are recommended.

These toilets get washed away in flood or natural calamities. In flood prone areas, toilets must be structurally strong enough to withstand emergency situation. The construction cost may be higher but it would be durable. The subsidy to the BPL families accordingly may be higher. One should not compromise with the safety of the toilet structures in emergency situation.

Gajanan Kale, Apeksha Homoeo Society, Amraoti, Maharashtra

Our organisation works in the area of water and sanitation for last 20 years. To stop the open defecation in 10 villages we have build the low cost Latrin on the roadside. Also in these villages the poor people did not agree to build the toilet, our worker motivated the villagers and builds the toilet. We feel continue following up is very important. Maharashtra government stared the sanitation and hygiene program in Maharashtra and kept the target of build latrines. The program was very good but target oriented program started by Panchayat Samiti made large number toilets with low height, so in rainy season the rain water comes in toilet. This water is also sometimes contaminated. This caused water borne diseases in villages.

I feel that government's attitude is most import in this issue. 80 per cent population lives in villages with rivers around. The villagers go to open defication in river side and wash the animal fists. This must be banned and strict action must be taken against those who don't follow.

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Solution Exchange for the Water Community in India at se-wes@solutionexchange-un.net.in and Disaster Community in

India at se-drm@solutionexchange-un.net.in with the subject heading "Re: [se-watr] [se-drm] Query: New Approaches to Better Sanitation During Emergencies - Examples; Advice. Additional Reply."

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